CLAIMS

What is claimed is:

1. A galvanic probe comprising

a sensor electrode having an exposed surface comprising (1) a first material selected from the group consisting of noble metals, antimony, and bismuth, and (2) optionally, an oxide or hydroxide of the first material, and

a reference electrode spaced apart from the sensor electrode and having an exposed surface comprising (1) a second material selected from the group consisting of zinc and magnesium, and (2) optionally, an oxide or hydroxide of the second material.

2. A galvanic probe as set forth in claim 1 wherein the first material is selected from the group consisting of antimony and bismuth.

3. A galvanic probe as set forth in claim 2 wherein the first material is antimony.

4. A galvanic probe as set forth in claim 1 wherein the first material is a noble metal.

5. A galvanic probe as set forth in claim 4 wherein the first material is selected from the group consisting of platinum, silver and gold.

6. A galvanic probe as set forth in claim 5 wherein the first material is platinum.

7. A galvanic probe as set forth in claim 2, further comprising a second sensor electrode wherein the second sensor electrode has an exposed surface comprising a noble metal and, optionally, an oxide or hydroxide of the noble metal.

8. A galvanic probe as set forth in claim 3 wherein the sensor electrode is a first sensor electrode, and further comprising a second sensor electrode wherein the second sensor electrode has an exposed surface comprising a noble metal and, optionally, an oxide or hydroxide of the noble metal.

9. A galvanic probe as set forth in claim 7 wherein the noble metal is selected from the group consisting of platinum, silver and gold.

10. A galvanic probe as set forth in claim 8 wherein the noble metal is selected from the group consisting of platinum, silver and gold.

11. A galvanic probe as set forth in claim 9 wherein the noble metal is platinum.

12. A galvanic probe as set forth in claim 10 wherein the noble metal is platinum.

13. A galvanic probe as set forth in claim 1 wherein the exposed surface of the reference electrode comprises zinc.

14. A galvanic probe as set forth in claim 13 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

15. A galvanic probe as set forth in claim 13 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

16. A galvanic probe as set forth in claim 3 wherein the exposed surface of the reference electrode comprises zinc.

17. A galvanic probe as set forth in claim 16 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

18. A galvanic probe as set forth in claim 16 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

19. A galvanic probe as set forth in claim 6 wherein the exposed surface of the reference electrode comprises zinc.

20. A galvanic probe as set forth in claim 19 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

21. A galvanic probe as set forth in claim 19 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

22. A galvanic probe as set forth in claim 12 wherein the exposed surface of the reference electrode comprises zinc.

23. A galvanic probe as set forth in claim 22 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

24. A galvanic probe as set forth in claim 22 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

25. A galvanic probe as set forth in claim 2, further comprising a circuit, said electrodes generating a signal when the electrodes are in contact with a fluid having a pH such that the electrodes are in electrochemical communication with each other, the signal being input to and processed by said circuit.

26. A galvanic probe as set forth in claim 25 wherein a voltage differential exists between the electrodes and the signal is the voltage differential or amperage of a current flowing through the circuit, said current being produced galvanically by the electrodes in interaction with the fluid.

27. A galvanic probe as set forth in claim 26 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of the pH of the fluid.

28. A galvanic probe as set forth in claim 27 wherein the signal processor transmits the information to a display that displays the pH of the fluid.

29. A galvanic probe as set forth in claim 28 wherein the display is in wireless communication with the signal processor.

30. A galvanic probe as set forth in claim 26 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of an amount of a composition that should to be added to the fluid to adjust the pH of the fluid to a desired pH.

31. A galvanic probe as set forth in claim 30 wherein the signal processor transmits the information to a display for displaying data from which may be determined the amount of a composition that should to be added to the fluid to adjust the pH of the fluid to the desired pH.

32. A galvanic probe as set forth in claim 16, further comprising a circuit, said electrodes generating a signal when the electrodes are in contact with a fluid having a

pH such that the electrodes are in electrochemical communication with each other, the signal being input to and processed by said circuit.

33. A galvanic probe as set forth in claim 32 wherein a voltage differential exists between the electrodes and the signal is the voltage differential or amperage of a current flowing through the circuit, said current being produced galvanically by the electrodes in interaction with the fluid.

34. A galvanic probe as set forth in claim 33 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of the pH of the fluid.

35. A galvanic probe as set forth in claim 34 wherein the signal processor transmits the information to a display that displays the pH of the fluid.

36. A galvanic probe as set forth in claim 35 wherein the display is in wireless communication with the signal processor.

37. A galvanic probe as set forth in claim 33 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of an amount of a composition that should to be added to the fluid to adjust the pH of the fluid to a desired pH.

38. A galvanic probe as set forth in claim 33 wherein the signal processor transmits the information to a display for displaying data from which may be determined the amount of a composition that should to be added to the fluid to adjust the pH of the fluid to the desired pH.

39. A galvanic probe as set forth in claim 6, further comprising a circuit, said electrodes generating a signal when the electrodes are in contact with a fluid having an ORP such that the electrodes are in electrochemical communication with each other, the signal being input to and processed by said circuit.

40. A galvanic probe as set forth in claim 39 wherein a voltage differential exists between the electrodes and the signal is the voltage differential or amperage of a current flowing through the circuit, said current being produced galvanically by the electrodes in interaction with the fluid.

41. A galvanic probe as set forth in claim 40 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of the ORP of the fluid.

42. A galvanic probe as set forth in claim 41 wherein the signal processor transmits the information to a display that displays the ORP of the fluid.

43. A galvanic probe as set forth in claim 42 wherein the display is in wireless communication with the signal processor.

44. A galvanic probe as set forth in claim 40 wherein said circuit comprises a signal processor and the signal processor translates the signal to information indicative of an amount of a composition that should to be added to the fluid to adjust the ORP of the fluid to a desired ORP.

45. A galvanic probe as set forth in claim 40 wherein the signal processor transmits the information to a display for displaying data from which may be determined the amount of a composition that should to be added to the fluid to adjust the ORP of the fluid to the desired ORP.

46. A galvanic probe as set forth in claim 42 wherein the oxidation reduction potential measurements correspond to chlorine levels in the fluid.

47. A galvanic probe as set forth in claim 12, further comprising a first circuit, said first sensor electrode and said reference electrode generating a first signal when said first sensor electrode and said reference electrode are in contact with a fluid having a pH such that said first sensor electrode and said reference electrode are in electrochemical communication with each other, said first signal being input to and processed by said first circuit, and still further comprising a second circuit, said second sensor electrode and said reference electrode generating a signal when said second sensor electrode and said reference electrode are in contact with a fluid having an ORP such that said second sensor electrode and said reference electrode are in electrochemical communication with each other, said second signal being input to and processed by said second circuit.

48. A galvanic probe as set forth in claim 47 wherein a voltage differential exists between each sensor electrode and the reference electrode and the signals are the voltage differentials or amperages of currents flowing through the respective circuits, said currents being produced galvanically by the electrodes in interaction with the fluid.

49. A galvanic probe as set forth in claim 48 wherein said first circuit comprises a first signal processor, said second signal processor translating the first

signal to information indicative of the pH of the fluid, and said second circuit comprises a second signal processor, said second signal processor translating the signal to information indicative of the ORP of the fluid.

50. A galvanic probe as set forth in claim 49 wherein the first signal processor transmits the information to a display that displays the pH of the fluid, and the second signal processor transmits the information to a display that displays the ORP of the fluid.

51. A galvanic probe as set forth in claim 50 wherein the display for displaying the pH levels is a first display and the display for displaying the ORP levels is a second display, the first display is in wireless communication with the first signal processor and the second display is in wireless communication with the second signal processor.

52. A galvanic probe as set forth in claim 48 wherein said first circuit comprises a first signal processor, the first signal processor translating the first signal to pH-related information indicative of an amount of a composition that should to be added to the fluid to adjust the pH of the fluid to a desired pH, and said second circuit comprises a second signal processor, the second signal processor translating the second signal to ORP-related information indicative of an amount of a composition that should to be added to the fluid to adjust the ORP of the fluid to a desired ORP.

53. A galvanic probe as set forth in claim 52 wherein the first signal processor transmits the pH-related information to a display for displaying data from which may be determined the amount of a composition that should to be added to the fluid to adjust the pH of the fluid to the desired pH, and the second signal processor transmits the ORP-related information to a display for displaying data from which may be determined the amount of a composition that should to be added to the fluid to adjust the ORP of the fluid to the desired ORP.

54. A device for controlling the pH of a fluid in a vessel to a desired pH level, comprising:

(a) a sensor electrode having an exposed surface comprising (1) a first material selected from the group consisting of antimony, and bismuth, and (2) optionally, an oxide or hydroxide of the first material;

(b) a reference electrode spaced apart from the sensor electrode and having an exposed surface comprising (1) a second material selected from the group consisting of zinc and magnesium, and (2) optionally, an oxide or hydroxide of the second material; and

(c) a circuit;

arranged such that said electrodes generate a signal when the electrodes are in contact with a fluid having a pH such that the electrodes are in electrochemical communication with each other, the signal being input to and processed by said circuit.

55. A device as set forth in claim 54, further comprising a signal processor, the signal processor translating the signal to information indicative of an amount of a composition that should to be added to the fluid to adjust the pH of the fluid to a desired pH.

56. A device as set forth in claim 55, further comprising a supply of the composition and a dispenser control in communication with the signal processor such as to receive the information, the dispenser control causing the amount of the composition that should to be added to the fluid to be dispensed in response to receipt of the information.

57. A device for controlling the pH of a fluid in a vessel to a desired ORP level, comprising:

(a) a sensor electrode having an exposed surface comprising (1) a noble metal, and (2) optionally, an oxide or hydroxide of the first material;

(b) a reference electrode spaced apart from the sensor electrode and having an exposed surface comprising (1) a second material selected from the group consisting of zinc and magnesium, and (2) optionally, an oxide or hydroxide of the second material; and

(c) a circuit;

arranged such that said electrodes generate a signal when the electrodes are in contact with a fluid having an ORP such that the electrodes are in electrochemical communication with each other, the signal being input to and processed by said circuit.

58. A device as set forth in claim 57, further comprising a signal processor, the signal processor translating the signal to information indicative of an amount of a composition that should to be added to the fluid to adjust the ORP of the fluid to a desired ORP.

59. A device as set forth in claim 58, further comprising a supply of the composition and a dispenser control in communication with the signal processor such as to receive the information, the dispenser control causing the amount of the composition that should to be added to the fluid to be dispensed in response to receipt of the information.

60. A device as set forth in claim 59 wherein the oxidation reduction potentials correspond to chlorine levels in the fluid.

61. A method for measuring pH of a fluid, comprising placing the electrodes of the galvanic probe of claim 28 into a fluid and reading the pH from the display.

62. A method for measuring pH of a fluid, comprising placing the electrodes of the galvanic probe of claim 35 into a fluid and reading the pH from the display.

63. A method for measuring the oxidation reduction potential of a fluid, comprising placing the electrodes of the galvanic probe of claim 42 into a fluid and reading the oxidation reduction potential from the display.

64. A method for measuring the oxidation reduction potential of a fluid, comprising placing the electrodes of the galvanic probe of claim 50 into a fluid and reading the oxidation reduction potential from the display.

65. A galvanic cell comprising an electrolyte in contact with:

a) a sensor electrode having an exposed surface comprising (1) a first material selected from the group consisting of noble metals, antimony, and bismuth, and (2) optionally, an oxide or hydroxide of the first material; and

b) a reference electrode spaced apart from the sensor electrode and having an exposed surface comprising (1) a second material selected from the group consisting of zinc and magnesium, and (2) optionally, an oxide or hydroxide of the second material.

66. A galvanic cell as set forth in claim 65, wherein the first material is selected from the group consisting of antimony and bismuth.

67. A galvanic cell as set forth in claim 66 wherein the first material is antimony.

68. A galvanic cell as set forth in claim 65 wherein the first material is a noble metal.

69. A galvanic cell as set forth in claim 68 wherein the first material is platinum.

70. A galvanic probe as set forth in claim 66 wherein the exposed surface of the reference electrode comprises zinc.

71. A galvanic probe as set forth in claim 70 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

72. A galvanic probe as set forth in claim 70 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

73. A galvanic probe as set forth in claim 67 wherein the exposed surface of the reference electrode comprises zinc.

74. A galvanic probe as set forth in claim 73 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

75. A galvanic probe as set forth in claim 73 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

76. A galvanic probe as set forth in claim 68 wherein the exposed surface of the reference electrode comprises zinc.

77. A galvanic probe as set forth in claim 76 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

78. A galvanic probe as set forth in claim 76 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.

79. A galvanic probe as set forth in claim 69 wherein the exposed surface of the reference electrode comprises zinc.

80. A galvanic probe as set forth in claim 79 wherein the exposed surface of the reference electrode consists essentially of zinc and, optionally, zinc oxide, zinc hydroxide or both.

81. A galvanic probe as set forth in claim 79 wherein the exposed surface of the reference electrode comprises zinc of purity in excess of 99.9% and, optionally, zinc oxide, zinc hydroxide or both.